

NOTES

RARE AND NOTEWORTHY VASCULAR PLANTS FROM THE FORT CAMPBELL MILITARY RESERVATION, KENTUCKY AND TENNESSEE

There are about 900 Department of Defense (DoD) installations scattered across the United States, ranging in size from less than two to nearly two million acres. Biological diversity on many of these sites is undocumented because the installations have been (are) off-limits to unauthorized personnel for a multitude of reasons, including safety and security. However, The Nature Conservancy and DoD are cooperating to identify, study, manage, and restore biologically and culturally significant resources on many DoD lands (Nickens 1993), including the Fort Campbell Military Reservation (FCMR) in south-central Kentucky and northwestern central Tennessee.

The FCMR occupies 105,000 acres, with approximately two-thirds of the area in Tennessee (Montgomery & Stewart counties) and one-third in Kentucky (Christian & Trigg counties). The Reservation was created in 1942 from a region that was mostly agricultural and now includes a city-like cantonment area with a variable population of about 30,000, extensive fields-forests used for various kinds of military exercises and training but with several inaccessible impact and live-fire areas, and a federal railroad right-of-way extending 20.8 km to Hopkinsville, Kentucky.

Physiographically, FCMR cuts across two subsections of the Highland Rim Section of the Interior Low Plateaus Physiographic Province as described by Quarterman and Powell (1978). The Pennyroyal Plain Subsection, occupying the central part of the Reservation, is a level-rolling karstic landscape mostly coincident with the historic "Big Barrens" Region of Kentucky and Tennessee. The remainder (western and eastern ends) is within the dissected Western Highland Rim Subsection. Drainage is by tributaries of the Cumberland River; elevations above sea level range from 122–213.5 m.

METHODS

During 102 trips from 15 March 1993–31 October 1994, and 10 trips from August–October 1995, we botanically surveyed accessible areas of FCMR, especially seeking taxa listed as elements of concern by one or both states and/or federally (Kentucky State Nature Preserves Commission 1992, herein updated to the 1995 list; Tennessee Department of Environment and Conservation 1993, herein updated to the 1994 list; U.S. Fish and

Wildlife Service 1993). The Kentucky portion of the Reservation was the responsibility of LEM, while the Tennessee portion was that of EWC and BEW. David Campbell was the Tennessee Nature Conservancy Project Manager and coordinated the study. In addition to field studies, FCMR specimens were sought in regional herbaria. Nomenclature follows Wofford and Kral (1993); distribution data cited are from Gleason and Cronquist (1991) unless otherwise noted.

RESULTS AND DISCUSSION

Listed Taxa

Twenty-one state listed species, including three candidates for federal listing, were found during field surveys. Table 1 gives these species, their FCMR county distribution, and listed rankings. Vouchers for these taxa are at one or more of: APSC, EKU, TENN, VDB. Fourteen of the 21 species are of limited occurrence and thus listed elements in Kentucky or Tennessee because these states are peripheral to their range. Most of these species are abundant elsewhere (*Prenanthes barbata* and *Tomanthera auriculata*, rare throughout their ranges, are exceptions).

Floristic affinities of the 14 extraneous taxa are shown when they are grouped according to their distributional locus in relation to FCMR. The extent of FCMR populations is parenthetically noted. Seven taxa have western-northwestern distributions: *Aster paludosus* ssp. *hemisphericus* (infrequent at one site), *Hieracium longipilum* (abundant at several sites), *Muhlenbergia glabrifloris* (large stands at several sites), *Prenanthes aspera* (a few plants at one site), *Rudbeckia subtomentosa* (abundant at several sites), *Silphium laciniatum* (abundant at several sites), and *Tomanthera auriculata* (abundant at several sites). Six southern taxa include *Carex alata* (abundant at one site), *Gymnopogon ambiguus* (a few plants at six sites), *Malus angustifolia* (a few trees at one site), *Oenothera linifolia* (abundant in the Tennessee portion, rare in Kentucky), *Prenanthes barbata* (scattered individuals), and *Scleria ciliata* (abundant at one site). *Populus grandidentata* (several trees at one FCMR site) is a northern species.

The remaining seven species are basically intraneous in distribution. *Phacelia ranunculacea* (abundant at two sites) has three centers of distribution, Atlantic Coastal Plain of Virginia and Maryland, the Piedmont of North Carolina, and the Mississippi Embayment and adjacent provinces of several states; it is locally abundant but occurrences are scattered to rare (Chuang & Constance 1977). *Silphium pinnatifidum* Elliott [*S. terebinthinaceum* Jacq. var. *pinnatifidum* (Ell.) A Gray] (abundant at several sites) is found only in Alabama, Georgia, Kentucky, and Tennessee (Fisher & Speer 1978)

TABLE 1. Listed taxa known from the Fort Campbell Military Reservation, Kentucky and Tennessee, their known county distribution at FCMR¹, and their Kentucky and Tennessee², National³, and Global Status⁴.

Taxa	Distr.	KY	TN	Nat.	Global
<i>Aster paludosus</i> Ait. ssp. <i>hemisphericus</i> (Alex.) Cronq. ROUND-HEAD ASTER (Asteraceae)	T	E	–	–	G 5
<i>Carex alata</i> Torrey WINGED-FRUITED SEDGE (Cyperaceae)	C	T	–	–	G 5
<i>Carex decomposita</i> Muhl. CYPRESS-KNEE SEDGE (Cyperaceae)	M	T	–	–	G 5
<i>Gymnopogon ambiguus</i> (Michx.) BSP. BEARDGRASS (Poaceae)	C,M	S	–	–	G 5
<i>Hieracium longipilum</i> Torrey LONG-HAIRED HAWKWEED (Asteraceae)	M,S,T	T	S	–	G4/G5
<i>Hydrastis canadensis</i> L. GOLDENSEAL (Ranunculaceae)	M,S	–	T	–	G 4
<i>Juglans cinerea</i> L. WHITE WALNUT (Juglandaceae)	S	S	T	C2	G3/G4
<i>Malus angustifolia</i> (Aiton) Michx. SOUTHERN CRABAPPLE (Rosaceae)	C	S	–	–	G 5
<i>Muhlenbergia glabrifloris</i> Scribn. SMOOTH MUHLY (Poaceae)	C,T	S	S	–	G 4
<i>Oenothera linifolia</i> Nutt. THREAD-LEAVED SUNDROPS (Onagraceae)	C,M,S,T	E	–	–	G 5
<i>Panax quinquefolius</i> L. GINSENG (Araliaceae)	M,S	–	T	–	G 4
<i>Phacelia ranunculacea</i> (Nutt.) Const. BLUE SCORPIONWEED (Hydrophyllaceae)	M	S	S	–	G 4
<i>Platanthera peramoena</i> (Gray) Gray PURPLE FRINGELESS ORCHID (Orchidaceae)	M	–	T	–	G 5
<i>Populus grandidentata</i> Michx. BIG-TOOTH ASPEN (Salicaceae)	M	–	S	–	G 5
<i>Prenanthes aspera</i> Michx. ROUGH RATTLESNAKE ROOT (Asteraceae)	T	E	E	–	G 4
<i>Prenanthes barbata</i> (T.&G.) Mil. RATTLESNAKE ROOT (Asteraceae)	M	E	S	C2	G2/G3
<i>Rudbeckia subtomentosa</i> Pursh SWEET CONEFLOWER (Asteraceae)	C,M,S,T	E	T	–	G 5
<i>Scleria ciliata</i> Michx. NUTRUSH (Cyperaceae)	T	E	–	–	G 5
<i>Silphium laciniatum</i> L. COMPASS-PLANT (Asteraceae)	M,S,C	E	T	–	G 5
<i>Silphium pinnatifidum</i> Elliott PRAIRIE DOCK (Asteraceae)	M	–	T	–	G 3
<i>Tomanthera auriculata</i> (Michx.) Raf. EARLEAF FOXGLOVE (Scrophulariaceae)	M	– ⁵	E	C2	G 2

¹Known county distribution at FCMR given as: C = Christian Co., KY; M = Montgomery Co., TN; S = Stewart Co., TN; T = Trigg Co., KY.

²E = endangered, T = threatened, S = special concern.

³C2 = a candidate for federal listing.

⁴Global rankings: G2 = imperiled globally because of rarity or because of some factors making it very vulnerable to extinction throughout its range; G3 = either very rare and local throughout its range or found locally (even abundantly) in a restricted range, or because of some other factors making it vulnerable to extinction throughout its range; G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery; G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

⁵*Tomanthera auriculata* is not known from Kentucky and thus not listed there.

and is infrequent to rare throughout its range. *Carex decomposita* (numerous clumps at one site) and *Platanthera peramoena* (several small populations) range over much of eastern U.S., but are infrequent to rare in occurrence. *Juglans cinerea* (five trees and numerous juveniles at one site) also is wide-ranging in eastern U.S., but is in general decline and now extirpated from several areas (Anderson & LaMadeleine 1978; Rink 1990). Lastly, *Hydrastis canadensis* (several large populations) and *Panax quinquefolius* (several small populations), are wide-ranging but rare, primarily because of loss of habitat and commercial exploitation.

State Records

Two non-native taxa new to the known flora of Tennessee were found.

Nymphoides peltata (Gmel.) Kuntze (YELLOW FLOATING-HEART, Menyanthaceae) is a rooted, floating-leaved aquatic native to southern Europe and Asia Minor. It was introduced into this country for cultivation in garden pools, but has become sporadically naturalized over much of eastern U.S. However, it has not been reported for states south of Virginia or east of Louisiana, Arkansas, and Missouri (Godfrey & Wooten 1981). This report, based on an extensive population in a Reservation pond, adds not only the species but also the genus and family to the known Tennessee flora.

Voucher specimens: TENNESSEE. Montgomery Co.: pond by FCMR golf course, 19 Jun 1993, *Wofford 93-23* (TENN); 6 Jun 1994, *Chester 13040* (APSC).

Richardia brasiliensis (Moq.) Gomez (without vernacular, Rubiaceae) is a diffuse, pilose annual or perennial native to South America. It has become a naturalized weed, primarily on the Coastal Plain from Texas to Florida and northward to Virginia. FCMR plants were in sandy soil of a disturbed field where rareness indicates that it is either a recent introduction or is slow to become naturalized in the area.

Voucher specimen: TENNESSEE. Montgomery Co.: FCMR, field on N side of Oriental Village Road at junction with Hellcat Road, 20 Oct 1994, *Wofford & Chester 13150* (TENN).

Other Noteworthy Taxa

Two FCMR taxa are noteworthy because of their limited distribution in Tennessee.

Phragmites australis (Cav.) Trin. ex Steud. (REED-GRASS, Poaceae) is often weedy and occurs over much of the U.S. except for several southern states. Previous Tennessee reports are from Henry County, northern west Tennessee (DeSelm et al. 1994).

Voucher specimen: TENNESSEE. Montgomery Co.: beaver-formed marsh at jct of Jordan Springs Road and Oriental Village Road, FCMR, 28 Aug 1993, *Wofford & Chester 12996* (APSC, TENN, VDB).

Psoralea onobrychis (Nutt.) Rydb. (SCURF-PEA, Fabaceae) ranges from Ohio and Kentucky to Iowa and Missouri, and also is found in West Virginia, Tennessee, and South Carolina. Isely (1990) reported it from one county each in North Carolina, South Carolina, and Virginia, and from two counties in Tennessee, noting that "material seen for reports from NC and TN is represented only by collections from the last century." The FCMR collection is from a dense stand of several hundred plants along a roadside-barren.

Voucher specimen: TENNESSEE. Montgomery Co.: barrens on N side of Ghost Corp Trail one mile E of Palmyra Road, FCMR, 2 Jul 1993, *Chester 12985* (APSC, TENN, VDB).

ACKNOWLEDGMENTS

This research (1993-1994) was funded by the Tennessee Chapter of the Nature Conservancy through the Legacy Resource Management Program. Numerous people at FCMR provided significant assistance, especially Eugene Zirkle, FCMR Coordinator for Land Condition Trend Analysis, who made studies possible in 1995.

—*Edward W. Chester, Department of Biology, Austin Peay State University, Clarksville, TN 37044, U.S.A.; B. Eugene Wofford, Department of Botany, The University of Tennessee, Knoxville, TN, 37996, U.S.A.; Landon E. McKinney, Kentucky State Nature Preserves Commission, 801 Schenkel Lane, Frankfort, KY 40601, U.S.A.; David Campbell, Tennessee Field Office, The Nature Conservancy, 50 Vantage Way, Suite 250, Nashville, TN 37215, U.S.A.*

REFERENCES

- ANDERSON, R.L. and L.A. LAMADELEINE. 1978. The distribution of butternut decline in the eastern United States. Forest Survey Report S-3-78. U.S. Dept. Agric., Forest Service, Washington, D.C.
- CHUANG, T.I. and L. CONSTANCE. 1977. Cytogeography of *Phacelia ranunculacea* (Hydrophyllaceae). *Rhodora* 79:115–122.
- DESELN, H.R., B.E. WOFFORD, R. KRAL, and E.W. CHESTER. 1994. An annotated list of grasses (Poaceae, Gramineae) of Tennessee. *Castanea* 59:338–353.

- FISHER, T.R. and J.M. SPEER. 1978. Systematic studies in the genus *Silphium*: possible origin of *S. pinnatifidum* Ell. (Compositae). *Environmental Physiology and Ecology of Plants* 1978:451–463.
- GLEASON H.A. and A. CRONQUIST. 1991. *Manual of vascular plants of northeastern United States and adjacent Canada*. New York Botanical Garden, Bronx.
- GODFREY, R.K. and J.W. WOOTEN. 1981. *Aquatic and wetland plants of southeastern United States. Volume 1, Dicotyledons*. University of Georgia Press, Athens.
- ISELY, D. 1990. *Vascular flora of the southeastern United States. Volume 3, Part 2, Leguminosae (Fabaceae)*. University of North Carolina Press, Chapel Hill.
- KENTUCKY STATE NATURE PRESERVES COMMISSION. 1992. *Endangered, threatened, and special concern plants and animals of Kentucky*. Unpublished list. Frankfort, Kentucky.
- NICKENS, E. 1993. Operation conservation. *Nat. Conservancy* 43(2):24–29.
- QUARTERMAN, E. and R.L. POWELL. 1978. *Potential ecological/geological natural landmarks on the Interior Low Plateaus*. U.S. Dept. Interior, Washington, D.C.
- RINK, G. 1990. *Juglans cinerea* L., Butternut. In: Burns, R. M. and B. H. Honkala (tech. cords.). *Silvics of North America, 2: hardwoods*. Agriculture Handbook 654. U.S. Dept. Agric., Forest Service, Washington, D.C. Pp. 386–390.
- TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION. 1994. *Rare plants of the State of Tennessee*, 17 May 1994. Ecological Services Division, Nashville, Tennessee.
- U.S. FISH AND WILDLIFE SERVICE. 1993. *Plant taxa for listing as endangered or threatened species: Notice of review*. Federal Register 58(188):51144–51190.
- WOFFORD, B.E. and R. KRAL. 1993. *Checklist of the vascular plants of Tennessee*. Sida, Bot. Misc. 10.